
VICTORIAN *E*NTOMOLOGIST

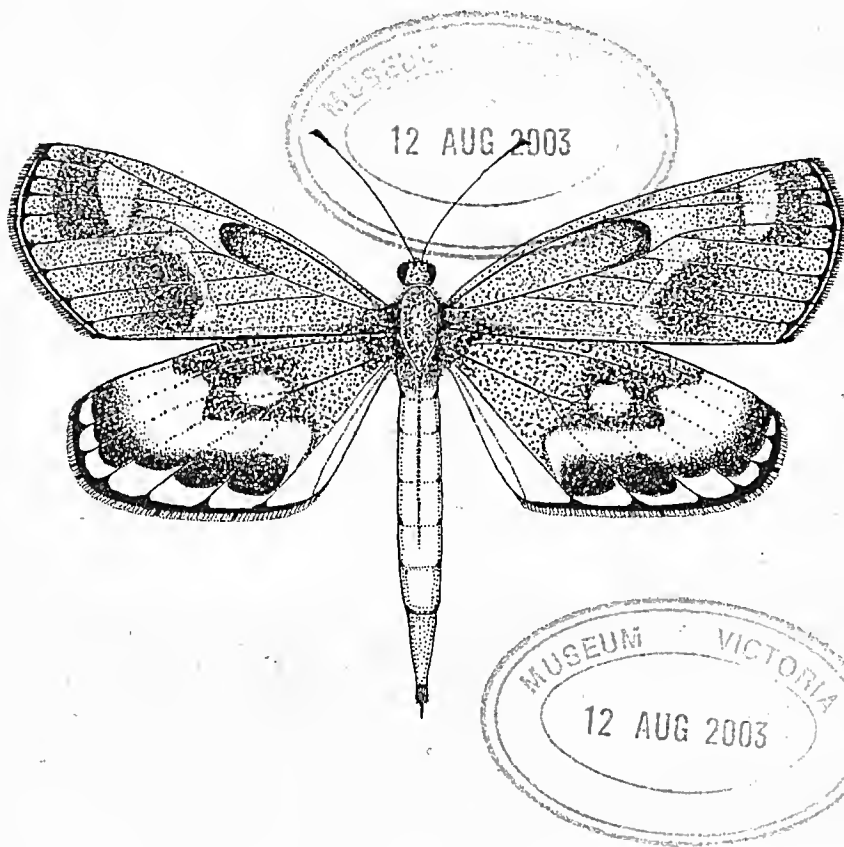


VOL. 33 No. 4

AUGUST 2003

Print Post Approved PP 349018/00058

Price: \$ 3.00



News Bulletin of The Entomological Society of Victoria Inc.

THE ENTOMOLOGICAL SOCIETY OF VICTORIA (Inc)

MEMBERSHIP

Any person with an interest in entomology shall be eligible for Ordinary membership. Members of the Society include professional, amateur and student entomologists, all of whom receive the Society's News Bulletin, the Victorian Entomologist.

OBJECTIVES

The aims of the Society are:

- (a) to stimulate the scientific study and discussion of all aspects of entomology,
- (b) to gather, disseminate and record knowledge of all identifiable Australian insect species,
- (c) to compile a comprehensive list of all Victorian insect species,
- (d) to bring together in a congenial but scientific atmosphere all persons interested in entomology.

MEETINGS

The Society's meetings are held at La Trobe University, 2nd Floor, Room 2.29, 215 Franklin Street, Melbourne (Opposite the Queen Victoria Market) Melway reference Map 2F B1 at 8 p.m. on the third Friday of even months, with the possible exception of the December meeting which may be held earlier. Lectures by guest speakers or members are a feature of many meetings at which there is ample opportunity for informal discussion between members with similar interests. Forums are also conducted by members on their own particular interest so that others may participate in discussions.

SUBSCRIPTIONS

Ordinary Member	\$20.00 (overseas members \$22)
Country Member	\$16.00 (Over 100 km from GPO Melbourne)
Student Member	\$12.00
Associate Member	\$ 5.00 (No News Bulletin)

Associate Members, resident at the same address as, and being immediate relatives of an ordinary Member, do not automatically receive the Society's publications but in all other respects rank as ordinary Members.

Cover design by Alan Hyman.

Cover illustration: The pale Sun Moth, *Synemon selene* Klug, is an endangered species restricted to perennial grassland dominated by *Austrodanthonia* in Western Victoria. It is now extinct in SA, and was presumed extinct in Vic. until its rediscovery, in February 1991, by the late Frank Noelker and Fabian Douglas. The Victorian Populations are parthenogenetic with all specimens comprising females, a most unusual trait in the Castniidae. Illustration by Michael F. Braby.

MINUTES OF THE GENERAL MEETING 20 JUNE 2003

Meeting opened 8.07 pm

Present: A. Kellehear, I. Endersby, P. Carwardine, D. Stewart, M. Endersby, R. McMahon, L., Faithfall, G. Weeks, P. Marriot and L. Cookson

Visitors: N. Poreh and N. Close

Apologies: D. Dobrosak, J. Tinetti and K. Walker

Minutes: Minutes of the 11 April 2003 general meeting [*Vic. Ent.* 33(2): 33] were accepted. M: P. Cardarine, S: P. Marriott.

Correspondence:

Mike Swan has forwarded a catalogue of books including those covering herpetology and insects .

Treasurer's Report:

Ian Endersby reported the account balances:

General account \$ 6996

Le Souëf account \$ 3815

In regard to membership, 101 members were financial with 21 unfinancial.

Editor's Report:

Articles for coming editions of the *Victorian Entomologist* are welcome. The position of editor is still in transition with the assistance of Daniel Dobrosak.

General Business:

The meeting place for general meetings and council meetings has been confirmed. The new location is at the Melbourne Museum, beginning with the 15 August general meeting. Meet at the main entrance at 7.50 pm for a group entry at 8.00 pm sharp! Meetings will be conducted downstairs at Infozone.

Item 7 of the previous council meeting asked for expressions of interest and availability from potential speakers for future meetings. Those interested should inform the council. In turn, Ken Walker will be informed, so as to facilitate access to the museum and prepare equipment for audio-visual equipment and the like.

Fabian Douglas has been in contact and is willing to travel to Melbourne to deliver a talk regarding Sun moths, accompanied with specimens! (Sun Moths are an endangered species listed under the Victorian Flora & Fauna Guarantee Act).

Ian Endersby suggested a follow-up with employees of the Department of Sustainability and Environment (formerly NRE), in regard to encouraging their attendance, considering relevance of the upcoming talk.

Peter Cardarwine proposed a potential club excursion site for late October. A site at Belgrave (near the Dandenong hills) prevailed over Anglesea or Lorne.

Members present elected 3 new members into the society: J. Booth, G. Mason and B. Orr.

Membership applications have been received from 2 individuals, both with an interest in moths.

Talks and displays:

The first of two talks for the evening was given by Ian Faithfall of the Keith Turnbull Institute. Ian's talk concentrated on scarab beetles (Coleoptera: Scarabaeidae) and covered their life-history, diversity, abundance, distribution, ecological and agricultural significance, with mention of some current research. Numerous slides were also shown.

Ian's talk was complimented by several cases full of scarab beetles which he also brought along.

The second talk of the evening was given by Ian Endersby in which he discussed the diversity within the order Neuroptera. All superfamilies were covered, then in turn the families with the common names to which we could more easily relate, such as the green and brown lacewings, antlions and owl-flies, mantispids, spongeflies, moth lacewings and dusty-wings.

Ray McMahon also brought along a display case of mixed insects collected during January to February 2003. Most of the insects were taken in south east Queensland, with the majority of those from one property in the Obi Obi valley near Maleny – about an 80 minute drive north of Brisbane.

The talks and displays made for a full evening which was both stimulating and educational, being appreciated by all present.

Meeting closed 9.52 pm.

MINUTES OF THE COUNCIL MEETING, 18th JULY, 2003

Meeting opened 8.05 pm

Present: D. Dobrosak, I. Endersby, A. Kellehear, D. Stewart, J. Tinetti, P. Carwardine,
R McMahon, P. Marriot,

Apologies: K. Walker

Correspondence:

- Letter from EBSCO offering to place information about the Society on their Web site will be considered again at next council meeting
- Dr T. Hawkeswood sent copies of the new journal *Spilopyra*.

Treasurer's Report:

- Account balances are: General account \$6740: Le Souëf account \$3821.
- Some membership dues remain outstanding. A reminder will be sent.

Editor's Report:

- Some articles for next issue are in hand. Please keep articles coming. Accompanying photographs are welcome.
- A suggestion to include some back copies of journal articles on the website was considered. Authors would need to be consulted about copyright.

General Business:

1. The next general meeting will be at the Museum. A letter will be sent informing all metropolitan members of the change.
2. There was discussion about speakers and activities for future meetings.
3. Council will send birthday greetings to A. Farnsworth.
4. Council will set up a 'welcome' kit of information for new members and visitors to meetings. We will also aim to have a program of events available in advance so that it can be made available to members and advertised'
5. There will be an excursion to Gembrook on 25-26 October. Accommodation is available at Gilwell Scout Camp, Launching Place Rd. Eight beds, camping facilities, and barbecue facilities are available. Day and night collection will be possible.
6. Council is still awaiting correspondence over one nomination for the Le Socuf award.
7. Council extends thanks to A. Kellehear for his work as president of the Society and best wishes in his new position in Tokyo.
8. Next council meeting will be at the Museum, 6pm. Friday Sept.19.

Meeting closed 9.12 pm.

Garden Observations of *Taractrocera Papyria* (Hesperiidae) (Including Coupling) in the Lower South East Region of South Australia

Bryan T Haywood
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Introduction

The White-banded grass-dart (*Taractrocera papyria*) is a species of grasslands, woodlands and open forest of South East Australia and is considered a Rare species in SA (Braby 2000, Grund 1998, and Grund and Hunt 2000). Grund (1998) describes how in SA this species is known to inhabit damp grassy areas especially near wetlands and is sometimes seen in urban areas where rank lawn/grasses occur. *T. papyria* is only seen sporadically and often in low numbers, factors Grund (1998) indicates have contributed to its Rare Conservation rating.

The observations reported in this note relate to the coupling of *T. papyria*, confirmation of female carrier during nuptial flight, and personal records of abundance observed in private garden and 5 acre revegetation area.

Observation of Coupling

Locality: Bryton Wood, Moorak, 5km SW of Mt Gambier in the lower south east of SA [37°52'S, 140°44'E]

Habitat: Previously grazed paddocks with pasture consisting of various introduced species including Phalaris, Yorkshire fog and Strawberry clover. In 2003 this site is a destocked revegetation area of 5 acres dominated by Rough-barked manna-gum (*Eucalyptus viminalis* ssp. *cygnetensis*) and Brown stringybark (*E. baxteri*) and various local native shrubs and introduced pasture grasses.

Date: 21 April 2003 at 1430h

Weather: Calm, warm and sunny day, approx. 22°C

An individual *T. papyria* was found, perched on a tall dry stem of phalaris within our revegetation area. The grass-dart was approx. 0.7m from the ground and very inconspicuous, being well camouflaged on the yellow/brown grass stem. At closer inspection (<2m) I realised that there were in fact two grass-darts present and they were mating. With great interest I took a closer look and noticed one in an almost vertical position along the tall stem and the other at an approx. 45° angle on a bent leaf blade. When moving even closer I startled them and the pair flew (vertical one of the pair as the carrier) some 3-4m and landed on the ground on dry yellowing grass. For this flight I observed the more vertical one of the pair as the carrier. They perched along the grass blade with the carrier on the right (Figure 1). The pair remained motionless for several minutes.



Figure 1 – Mating grass-darts on dried grass stem

During this time I layed down near them in the hope to catch a close up photograph. With very quiet and slow movements I managed to get the camera within 10cm of the pair. Photographs were taken (using a Sony Digital Mavica) from two angles in the hope to capture the perfect picture. The grass-darts barely moved (while I was at close range) with vertical up and down motions and slight opening of the wings observed.

Then after almost 5 minutes of observations the pair flew off. The carrier was the butterfly on the right in above figure.

Confirmation of the Carrier

After downloading the photographs onto my PC and having Braby (2000) close at hand, I determined that the butterfly I believed to be the carrier (on both occasions) was the female. The features I used for this identification were as follows; Slightly larger size, the hind-wing markings especially the curvature of the white band and size and orientation of the two dots were consistent with those in Braby (2000). I also contacted Kelvyn Dunn knowing his interest in coupling of butterflies and asked for him to confirm my identification of the sexes from the photographs. Kelvyn agreed with my identification.

Garden observations

T. papyria have been observed on my property since Autumn 2001. I have commonly sighted them feeding on Blue marguerite daisies (*Agathea coelestis*) in my front garden (Figure 2). In early March 2002, I regularly sighted grass-darts feeding at *A. coelestis* so decided to record their abundance knowing their apparent Rare conservation rating in SA. On one occasion I observed as many as ten individuals at once along this short stretch of garden. See Table 1 for abundance during 2002 season.

Table 1 – Abundance of *T. papyria* on Bryton Wood, Moorak (Mar-May 2002)

Date	Abundance (in front garden)
10 March 2002	2
17 March 2002	6
22 March 2002	3
24 March 2002	10
31 March 2002	6
1 April 2002	5
7 April 2002	1
18 April 2002	1 *
10 May 2002	1 *

* = Not observed in garden but on rank tall dried grass around property



Figure 2 – garden at front of house

The abundance I recorded was determined by walking backwards and forwards along the verandah (during the middle of the day) counting all the grass-darts I could see until I had made the same count twice reducing the chance of counting the same adult twice. Each counting period was of approximately 1-2 minutes in length.

Discussion

Common and Waterhouse (1981), Dunn (2000) and Dunn (2003) all describe how the female is commonly the carrier in Australian *Hesperiinae*. This fact was confirmed in this case using the orientation of the mating pair (from photographs), and observing two flights and one landing.

Dunn (2000) describes how the orientation of mating butterflies when perched can assist in determining the carrier. The stance adopted by this pair when perched either on the vertical dried

grass stem or the almost horizontal stem indicated the carrier to be the 'uppermost' adult. In these cases the carrier was the higher of the two and was later identified using photographs to be female.

Dunn (2003) noted how a related species (*T. ina*) at close range was easily approached and reluctant to fly, a feature I noted in *T. papyria*.

Dunn (2003) also cited camouflage sites for mating butterflies including the ground and grass. For this observation dried grass was the initial substrate I found them on, being similar in colour to the skippers themselves.

The abundance of *T. papyria* in my front garden in 2002 was extremely rewarding but difficult to explain. Undoubtedly the Blue marguerite offers a good adult food source and could be recommended as an attractant for grass-darts in other parts of Australia. Although larvae on food plants have not been found I can only assume they exist on or close to our property.

Despite the Rare conservation rating in SA for *T. papyria* this species may be more common than previously thought. More evidence of abundance in other areas would need to be recorded before substantiating this. Perhaps with more observers attuned into small skippers, more sightings like this one may be achieved.

Acknowledgement

I wish to thank Kelvyn Dunn for his encouragement to report this observation, sourcing reference material, confirmation of the female carrier, and comments on a draft of this paper. Thanks also to my dear friend Kath Alecock who provided grammatical advice to this paper.

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Literature Review – Urban Areas and Butterfly Conservation

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Introduction

The most serious threat facing butterflies today is undoubtedly the loss and degradation of habitats. Clearance of natural vegetation continues at an alarming rate, primarily for agriculture, forestry and urban development. In contrast to the earlier start in Europe and North America, butterfly conservation in Australia only reached scientific and political agendas in 1987 when a national campaign was mounted to save the Eltham Copper (*Paralucia pyrodisca*) from a housing development in Victoria. This campaign did much to increase public awareness of butterfly conservation in Australia (Braby, 2000).

The continuing rate of change in areas such as coastal south-eastern QLD and northern NSW is so fast and dramatic that many organisms, butterflies included, which depend on natural bushland areas for their survival cannot adapt to the rapidly changing conditions. Many Lepidoptera are very sedentary and local and their populations fluctuate greatly in response to natural mortality, without any risk to their sustained survival – dispersal being an important mechanism in enabling recolonisation of former habitats. However urban development may sever corridors between populations leading to inbreeding depression or even extinction in local populations of butterflies.

Wildlife resources such as native plants, weed patches and untrimmed hedges are now at least in some places – valued in urban areas. Such changes in attitude are likely to lead to the conservation of many habitats for butterflies, including suburban gardens which make up an increasingly large habitat along the eastern coast of Australia. However the effect of urbanisation on butterfly populations is one area which has not been extensively studied in this country.

Effects of Urbanisation on Butterfly Assemblages

There is relatively little published information on the effects of urbanisation on butterfly assemblages. Shapiro and Shapiro (1973) compared the butterfly fauna of Staten Island, New York in 1910 – when it was relatively undeveloped – to that of 1970 – when it was highly developed – and concluded that the species that were increasing in abundance and distribution were those typically associated with vacant lots (mostly weed feeding, vagile colonisers with a high reproductive rate) and those declining were native and specialised species. Yamamoto (1977) studied the butterflies of Sapporo, Japan and concluded that urbanisation brought about a general decline in the butterfly fauna and that the species least likely to be affected by urbanisation were those of urban areas, which hibernate during the pupal stage and reproduce three or more times a year.

More recently, Ruszczyk (1986) and Ruszczyk and DeArujo (1992) examined the distribution of butterflies in Port Alegre, Brazil. They found that increasing urbanisation was accompanied by a decrease in the number of species and the number of individual butterflies. As with the Shapiro and Shapiro (1973) study, these workers also found that dominant species of urban areas were those typical of open areas, especially highly mobile species with larvae that feed on exotic cultivated plants. Blair and Launer (1997) examined the distribution and abundance of butterfly species across an urban gradient within six sites near Palo Alto, California, USA. These sites represented a gradient of urban land use ranging from relatively undisturbed to highly developed. They found that butterfly species thought to be most representative of the original, predevelopment butterfly fauna progressively disappear as the sites become more urban.

The Potential of Gardens for Butterfly Conservation

Gardens are not, and never will be, substitutes for wild butterfly habitat. However, they may provide important stepping stones between more permanent habitat patches, and are important habitats in their own right, especially to those species that hibernate as adults and migrants who need to feed as they journey (Vickery, 1995). Published studies support the suggestion that suburban gardens have a great potential for

both the conservation and scientific study of butterflies. However policies for conserving Lepidoptera in Australia often focus on the rarity and distribution of a species rather than the threatening processes, such as loss of habitat due to urban development. Recovery actions must include an assessment of the current distribution and identify these threatening processes. Community groups and individuals can participate in recovery actions by managing habitat remnants, and replanting schools, reserves and gardens (Sands, 1999).

Most of the studies of the role suburban gardens play in butterfly conservation have been carried out in the UK. A national garden butterfly survey was launched in 1990 with the objective of discovering how many butterflies may be fostered in gardens. In general, larger gardens were found to contain more butterfly species than medium or small gardens, and diversity also increased with proximity to natural habitats, so that rural gardens attracted more species than urban or suburban areas (Vickery, 1995).

Vickery (1995) noted that from surveys carried out in the UK, some facts are emerging which indicate that suitably managed urban gardens can be extremely useful butterfly habitats. A number of urban gardens not near any wild habitat recorded some species more often than those near to wild habitat, raising the possibility that these species were the remains of colonies that once existed before the land was well developed and that they have survived in small numbers by continuing to breed in gardens.

Several other workers have noted the increasing role urban areas play in determining the fate of local butterfly populations. These include Hill (1986), who stated that by planting appropriate plant species and restricting insecticide use, diverse populations of butterflies could be maintained in urban areas. New (1997) also noted that not only is the value of native vegetation, including weed species now widely acknowledged, but the possible augmentation of butterflies by deliberately planting larval food plants and attractant nectar plants as food resources is also becoming more common. Vickery (1995) emphasised the great value of gardens as sources of nectar for butterflies in the UK, especially in spring and autumn when wild plants used as nectar sources may be scarce.

Several Australian authors have contributed to public awareness of the significance of urban areas in conserving butterfly species abundance. Elliot (1994) and Clyne (2000) listed general recommendations concerning butterfly host plants which provide food and shelter for larvae and other plants which produce nectar for the adult insects. Elliot (1994) noted that it is more likely that butterflies will visit and perhaps stay to breed if a garden has some wild or informal areas and that a heavily manicured garden does not appeal for breeding purposes to butterflies. Hay *et al* (1994) published 'Bring back the butterflies – butterfly gardening in Western Australia'. This book is intended to arouse interest in breeding resident Western Australian butterfly species and to stimulate regard for their long-term survival. McDonald (1998) listed a comprehensive range of native food plants suitable for growing in south-east Queensland including 30 nectar food plants, and provides detailed information on garden design and suitability of various groups of larval food plants for different soil types. Dunn (1996) published details of a Sword-grass Brown butterfly habitat restoration project which was carried out in Melbourne. The author noted that the project was instigated following increasing public concern about the future of two fragmented populations of this butterfly which were still lingering in the eastern Melbourne suburbs.

Nectar Plants

It is generally agreed that butterflies visit gardens primarily in order to feed on nectar plants and in order to create a good garden habitat it is of paramount importance to provide an abundance of nectar plants, with a succession of blooms from spring to late autumn (Vickery, 1995). Gardens can provide large quantities of nectar within a small area, and thus a butterfly does not need to expend as much energy in searching for nectar plants as over large tracts of wild habitat. One observation made from surveys in the UK was that a plant which is an excellent nectar plant in a single garden may be ignored in most other gardens. Extrapolation from observations in a single garden to the garden habitat as a whole has led to many inaccuracies in published lists of supposed good butterfly nectar plants in the UK. Conversely, the surveys have shown that there are many plants which are consistently used in gardens throughout the British Isles as nectar plants by butterflies (Vickery, 1991b, 1992a, 1993).

It appears that in order to attract specific butterfly species to a garden it is necessary to plant those nectar plants used by the species, as each butterfly species has its own preferences. In the UK there appears to be a connection between the presence and frequency of a butterfly species in gardens and the number of favourite nectar plants – gardens attracting the most butterfly species also usually growing the greatest variety of nectar plants. For example in the 1992 UK garden surveys, it was found that gardens with less than 20 different nectar plants had only a 30% chance of recording 14 or more butterfly species, while those with more than 20 nectar plant species had a 65% chance of doing so (Vickery, 1995).

Butterfly Mobility and duration of stay in Gardens

There appears to be little published work on this aspect of butterfly behaviour. Where results are available they generally show butterflies to be transient visitors to gardens. Although some Satyrinae stay several days, butterflies from other families seldom stay longer than several hours (Vickery, 1995). There are exceptions – in Australia several butterfly species have been recorded as garden residents, including the Zebra Blue (*Leptotes plinius*) which utilises ornamental *Plumbago* as a larval and adult food plant, and some smaller skipper species including *Ocybadistes* which will readily colonise wild unimproved garden corners (pers. obs.). Powell (1997) recorded detailed observations of the occurrence of the Australian admiral butterfly in his garden in south-western WA, noting that plantings of the larval food plant Native pellitory (*Paritaria debilis*) attracted a surprisingly high number of admirals, given how few were observed elsewhere. The author observed that the overall low number of admirals observed in Perth in general suggests that admirals may have been attracted to the garden from a considerable distance. He also assumed that the initial attraction was a chemical one, since Native pellitory is a small plant and not very conspicuous from any distance.

Most butterfly species are obviously mobile – the most mobile being those that are migratory or are strong fliers. Dispersal promotes gene flow between populations and enables recolonisation of habitats after local extinctions. However a major problem in conservation biology is how to facilitate dispersal between populations in an otherwise fragmented landscapes, butterflies being no exception. Butterfly species with high powers of dispersion can readily interbreed with individuals from distant populations and recolonise unoccupied habitats, however other less dispersive species will not readily do so. To cater for declining butterfly species and to facilitate their ability to recolonise sites using their intrinsic properties of dispersal will require more than the protection of existing colonies *in situ* (Shreeve, 1995). Consideration must be given to the provision of alternative sites including suburban gardens which provide at least suboptimal habitats. Gardens may provide stepping stones between more permanent habitat patches, and can act as habitats in their own right if conditions are suitable for visiting species.

Discussion

From a review of the literature it is clear that suburban gardens are considered to have great potential for the conservation of butterflies. Results of a study by Hill (1986) at sites around Brisbane (Toohey Forest, Mt Cotton, Redland Bay and the Mt Cootiba Botanical Gardens) suggest that it is vegetational diversity that determines butterfly species abundance. However the study by Hill was not looking at vegetational diversity in suburban gardens – the areas studied were considerably larger and with the exception of the Botanic Gardens consisted of mainly bushland habitats. The garden surveys carried out in the UK found that availability of nectar food plants, garden size and proximity to natural habitats largely determined butterfly species abundance in suburban gardens.

Hill (1986) suggested that it is the presence of the appropriate larval food plants that largely determines which butterfly species occur in a given area, and that adult food plants do not play an important role due to the high vagility of most butterfly species and the adaptability of butterflies in obtaining food resources. However considering results of the UK garden surveys, the species composition and abundance of nectar food plants should be considered as potentially important variables when determining abundance of butterfly species in suburban gardens. Garden size and proximity to natural habitat may also significantly influence abundances of certain butterfly species in the Australian urban landscape.

The habitat occupied by any butterfly species must include locations where host-plants grow in conditions that will facilitate larval growth and development and are accessible to egg-laying females. There must also

be pupation sites and sites for mate-location, as well as places for resting, roosting and adult feeding (Sbreeve, 1995). Observation of habitat selection should enable more accurate conclusions to be made of which type of garden habitat is preferred by individual butterfly species. Vegetation structure will also influence habitat selection; for example medium-sized native shrubs may be favoured by small butterflies as shelter sites. Larval food plant size may also influence oviposition behaviour – smaller plants or plants which have been pruned may have a greater availability of new growth favoured by larvae of many butterfly species. It has also been suggested that successful breeding is dependent on the quality and quantity of nectar butterflies imbibe, thus gardens may help butterflies to breed, even if this does not take place within their boundaries (Porter, 1992).

Assessing butterfly populations in suburban gardens featuring different vegetation characteristics should reveal the influence of each of these characteristics on the relative abundances of individual butterfly species. If certain vegetation characteristics are found to affect habitat selection for particular butterfly species, then this information will be of use in assisting their conservation. This is dependent, however, on all garden patches having been subject to similar levels of initial disturbance, and their having returned to the same equilibrium level. Recent local disturbances such as pesticide use or modification of vegetation by trimming or removal of plants may affect butterfly species abundances. This would need to be considered when selecting suitable study sites; ideally all gardens selected being subject to similar cultivation practices and disturbance histories.

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Australian Journal of Entomology Volume 42, Part 2, 2003

The Australian Entomological Society publishes the *Australian Journal of Entomology* quarterly. The Entomological Society of Victoria is an affiliated society and will, in future, publish the contents of the Journal for the wider interest of its members.

BIOGEOGRAPHY

RG Hollingsworth, RAI Drew, AJ Allwood, M Romig, M Vagalo & F Tsatsia: Host plants and relative abundance of fruit fly (Diptera: Tephritidae) species in the Solomon Islands.

M Carver, N Blüthgen, JF Grimshaw & GA Bellis: *Aphis clerodendri* Matsumura (Hemiptera: Aphididae), attendant ants (Hymenoptera: Formicidae) and associates on *Clerodendrum* (Verbenaceae) in Australia.

ECOLOGY

BW Cribb, B Brei, AW Ridley & DJ Merritt: Occurrence of immature *Culicoides molestus* (Skuse) (Diptera: Ceratopogonidae) in relation to habitat characteristics.

B Brei, BW Cribb & DJ Merritt: Effects of seawater components on immature *Culicoides molestus* (Skuse) (Diptera: Ceratopogonidae).

MY Steiner, S Goodwin, TM Wellham, IM Barchia & IJ Spöhr: Biological studies of the Australian predatory mite *Typhlodromips montlorensis* (Schicha) (Acari: Phytoseiidae), a potential biocontrol agent for western flower thrips, *Frankliniella occidentalis* (Pergande) (Thysanoptera: Thripidae).

MY Steiner, S Goodwin, TM Wellham, IM Barchia & IJ Spöhr: Biological studies of the Australian predatory mite *Typhlodromalus lailae* (Schicha) (Acari: Phytoseiidae).

MF Braby & KA Lyons: Effect of temperature on development and survival in *Delius nigrina* (Fabricius) (Lepidoptera: Pieridae).

BEHAVIOUR

BG Howlett & AR Clarke: Role of foliar chemistry versus leaf-tip morphology in egg-batch placement by *Chrysophtharta bimaculata* (Olivier) (Coleoptera: Chrysomelidae).

S Raghu & AE Lawson: Feeding behaviour of *Bactrocera cacuminata* (Hering) (Diptera: Tephritidae) on methyl eugenol: a laboratory assay.

PEST MANAGEMENT

PK Grundy & DA Maelzer: Towards the on-farm conservation of the assassin bug *Pristhesancus plagipennis* (Walker) (Hemiptera: Reduviidae) during winter using crop plants as refuges.

SYSTEMATICS

PG Allsopp: Synopsis of *Antitrogon* Burmeister (Coleoptera: Scarabaeidae: Melolonthini).

JS Ashe: *Weiria australis* gen. n., sp. n., the first fully myrmecoid aleocharine staphylinid from Australia (Coleoptera: Staphylinidae: Aleocharinae: Aenictoteratini).

SV Mironov, J Dabert & HC Proctor: New feather mites of the family Pterolichidae (Acari: Pterolichoidea) from parrots (Aves: Psittaciformes) in Australia.

PHYSIOLOGY

EA Jarjees & DJ Merritt: Structure of the gut contents of *Trichogramma australicum* Girault (Hymenoptera: Trichogrammatidae) larvae fixed *in situ* in eggs of its host *Helicoverpa armigera* (Hübner) (Lepidoptera: Noctuidae).

THESIS SUMMARY

A Rortais: Distribution of two endemic and flightless tropical dung beetles, *Amphistomus pectoralis* Matthews and *Tennoplectron involucre* Matthews (Coleoptera: Scarabaeinae) at a rainforest edge.

Book Reviews

"Victorian Butterflies; and How to Collect Them" by Ernest Anderson and Frank Palmer Spry.

E. D. Edwards

CSIRO Entomology, GPO Box 1700, Canberra, ACT. 2601.

This useful little volume was published about 1893 by H. Hearne & Co. of Melbourne and contains some very recognizable illustrations of all the Victorian butterflies known to the authors with some sound information about their biology. The bibliographical history of the book is not well known.

Ferguson (1963) No. 5965 simply listed it as "8vo. Pp. 129. [3] (Index), [4] (advertisements). Maroon cloth boards, title in gold on front cover" published in 1893. Ferguson also mentioned a copy in the National Library of Australia with 80 pages. Musgrave (1932) and Moulds (1977) gave more information, listing "Pt 1, pp. 1-78, 1893; Pt 2, pp. 79-129, 1894". Moulds also referred to a book review published anonymously in the *Victorian Naturalist* 9 (12): 186 in April 1893. The *Catalogue of the Royal Entomological Society of London* (Anonymous 1980) stated that it was issued in two parts and pages 79-80 were repeated.

Part 1

From the above it is clear that the book was published in two parts. Part 1 was reviewed in the *Victorian Naturalist* in April 1893 and the preface was dated March so it must have been published in either March or April 1893. This review made it clear that Part 2 had not been published at that time and an advertisement in Part 1 stated that Part 2 would be published "during the course of the year" and would be sold for four shillings. There are extant copies of Part 1 which was published in a buff wrapper which had burgundy type and illustrated a specimen of "*Xenica achanta*" on the front cover. It was issued with a title page bearing the date of 1893 and an illustration of "*Ialmenus evagoras*". There were 80 pages, with page 79 being an index of scientific names and page 80 an index of common names, and 4 pages of advertisements. Part 1 was stapled and the wrapper applied over the staples. So far as I know the only publisher's binding was wrappers and there was no hardcover issue.

Part 2

Part 2 is dated 1894 on the front wrapper and was reviewed in the *Victorian Naturalist* 11 (1): 32 in April 1894 and so was published in, or before, April 1894. It was listed as available for three shillings so there must have been a change in price from the projected four shillings advertised in Part 1 in 1893. I have not seen separate copies of Part 2 but presumably they exist and presumably the only publisher's binding was wrappers. The Royal Entomological Society holds a bound copy where Parts 1 and 2 had been separately purchased, combined, and bound together by the Society with the original wrappers and advertisements retained. Except for the front wrapper of Part 2, however, the wrappers and advertisements have been bound in at the back. That this copy is a combination of the separate Parts 1 and 2 (rather than a publishers combined copy bound by the Society but with Part 1 wrapper and advertisements included but the rest of Part 1 discarded) is evidenced by the marks of the tops of the staples (as well as the staple holes throughout) at the beginning of Part 2 and the duplication of one of the pages of advertisements. On the evidence of the copy in the Royal Entomological Society library Part 2 had no title page and commenced with the Lycaenidae on p. 79. The index of Part 2 was actually an index of the scientific names of both parts and there seems to have been no published index to Part 2 alone. Part 2 contained no index to common names. The wrapper was pale blue with darker blue print and bore an illustration of *Ogyris amaryllis*. The wrapper did not mention "Part 2" and is dated 1894 and it is identical to the wrapper used in the publisher's issue of the combined parts. Part 2 was stapled and the wrapper applied over the staples.

Publisher's Combined Issue

The most common form of the book is as a single volume combining Parts 1 and 2 and produced as combined copies by the publisher. These must have been available from 1894 onwards. The publisher's combined copies were issued in a pale blue wrapper with an illustration of *Ogyris amaryllis* in dark blue on the front cover, identical to the wrapper of the separate Part 2. It contained 129 pages plus 2 pages of index to scientific names, one page of errata and four pages of advertisements. The number of pages of advertisements varied from copy to copy. The combined copies were stapled when issued in a wrapper and the wrapper applied over the staples. Combined copies were also issued in maroon cloth boards (the form seen by Ferguson) with "Victorian Butterflies" in gilt and sometimes also "Anderson & Spry" in gilt with a blind stamped border on the cover. The end papers were of a white marigold pattern on a pale orange back. Hardbound copies were sewn. It was usual at that period for publisher's binding to be done in irregular lots as orders arrived so there may be considerable variation in the form of copies which were bound for the publisher and, of course, copies subsequently bound or rebound by owners may take any form at all.

Some combined copies issued by the publisher omit the indices to Part 1 and run smoothly through pages 78-81. Some however, as in the copy held by the Royal Entomological Society and also some issued by the publisher, retain the indices to Part 1 and so duplicate pp. 79 and 80 because Part 2 starts with a different p. 79. There seems to be only one impression of Part 1 as errors pointed out in the *Victorian Naturalist* review of 1893 were not corrected but were listed in an erratum at the end of Part 2. There are two variants of Part 2 as the "s" in *Ogyris* on page 80 is misaligned in some copies and missing in others.

Combined copies issued in wrappers have the date 1894 on the wrapper but 1893 on the title page as a relic of the original Part 1. Combined copies in boards however, also retain the original 1893 title page but with no other date to indicate their issue in 1894. Combined copies were made up by the publisher from unbound sections of both parts but some were made up by removing the staples from Parts 1 and 2 and binding them afresh.

While Anderson & Spry in their book did not deliberately propose any new butterfly names they did accidentally validate the old manuscript name *Hesperilla ismene* Anderson & Spry which they attributed to Edward Newman who may have used it on specimen labels and which was published but not validated by Meyrick (Atkins and Edwards 1996). This is a synonym of *Toxidia parvulus* (Plötz) published in 1884 so the precise date of publication is only of academic interest.

I would be interested to hear details from readers who may know of original separate copies of Part 2.

There are 3 possible bibliographic references to the volumes.

Anderson, E. and Spry, F. P. 1893. *Victorian Butterflies; and how to collect them*. Part 1. Pp. 1-80, [4] (advertisements). H. Hearne, Melbourne.

Anderson, E. and Spry, F. P. 1894. *Victorian Butterflies; and how to collect them*. Part 2. Pp. 79-129, [3] (index), [2] (advertisements). H. Hearne, Melbourne.

Anderson, E. and Spry, F. P. 1894. *Victorian Butterflies; and how to collect them*. Pp. 1-129, [3] (index), [4] (advertisements). H. Hearne, Melbourne.

Acknowledgements

I thank Drs Max Moulds and Tim New for information. Ms Michelle Hearn of CSIRO[®] Black Mountain Library searched for copies of the books in libraries and Ms Berit Pedersen, Librarian of the Royal Entomological Society, very generously loaned a copy which greatly helped solve problems about the form of Part 2.

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"Mimika Butterflies"

E. D. Edwards

CSIRO Entomology, GPO Box 1700, Canberra, ACT. 2601.

"Mimika Butterflies" by Robert Gotts and Norris Pangemanan. 2003. 287 pp, 741 colour illustrations. Published by P.T. Freeport, Indonesia. Softcover. Cost SAUD 60 plus postage (1 copy packed for posting weighs 650g). This book is not available for commercial distribution but the senior author at 22 Dungara Place, Winnalee, NSW, 2777 has a very limited number of copies for disposal.

A real first, this is a richly illustrated book about the butterflies of the Timika-Tembagapura mining district in Indonesia's Papua Province (formerly Irian Jaya) which covers the area from mangroves to tree line along the road to the mine. In 1997 a comprehensive biodiversity survey was conducted and this book draws on that and particularly the extensive collecting over many years done by the second author. The book was sponsored by PT Freeport Indonesia and Crescent Technology Inc. and is part of a series on the flora and fauna of the area planned by the company. Mimika is the name of the district, as well as of the local tribe and is situated to the south of Mt Carstensz and adjacent is the Lorentz World Heritage Area. Records from the expeditions of A.F.R. Wollaston in 1909-1910 and 1912-1913 up the Otakwa River which are the only previous extensive records of the butterflies from the area have also been drawn on. With recent excellent books on the butterflies of Papua New Guinea and the Solomon Islands this book sheds much light on the butterflies of Indonesia's Papua Province about which very little has been published.

The book contains a short Introduction and then deals with the butterfly families from Papilionidae to Hesperidae and concludes with a Selected Bibliography and Species Index. All 248 species are beautifully illustrated in colour and in the Papilionidae and Nymphalidae there are many illustrations of the early stages with some in the other families. Many of the subspecies and some species have never been illustrated elsewhere. The text lists each species with scientific name and author and date and then comes a section of comments varying from 3 lines to a full page. Genera are also listed with comments. In the Hesperidae many of the species are listed without comment.

Written for the well-informed butterfly enthusiast, this book has a great deal to offer the more casual collector and the serious student or professional. Very well illustrated and well researched, a mine of information, it is highly recommended.

Ted Edwards.

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The charge for advertising is \$5.00 per half page.

The *Victorian Entomologist* is printed at MOORE Business Systems, 8 Redfern Road, Hawthorn, Victoria, 3123.

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DIARY OF COMING EVENTS

Friday 15 August General Meeting at Museum 8PM:

Fabian Douglas will present a talk on
"Sun Moths (Lepidoptera: Castniidae)"

Friday 20 Sept 6:30 Council Meeting

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